

University of Nebraska - Lincoln  
**DigitalCommons@University of Nebraska - Lincoln**

---

Center for Advanced Land Management  
Information Technologies--Publications

CALMIT: Center for Advanced Land Management  
Information Technologies

---

2003

# Land Cover Inventory of the Niobrara River Watershed

Patti R. Dappen

*University of Nebraska-Lincoln*, [pdappen@calmit.unl.edu](mailto:pdappen@calmit.unl.edu)

James W. Merchant

*University of Nebraska-Lincoln*, [jmerchant1@unl.edu](mailto:jmerchant1@unl.edu)

Follow this and additional works at: <http://digitalcommons.unl.edu/calmitpapers>

---

Dappen, Patti R. and Merchant, James W., "Land Cover Inventory of the Niobrara River Watershed" (2003). *Center for Advanced Land Management Information Technologies--Publications*. 4.

<http://digitalcommons.unl.edu/calmitpapers/4>

This Article is brought to you for free and open access by the CALMIT: Center for Advanced Land Management Information Technologies at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Center for Advanced Land Management Information Technologies--Publications by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

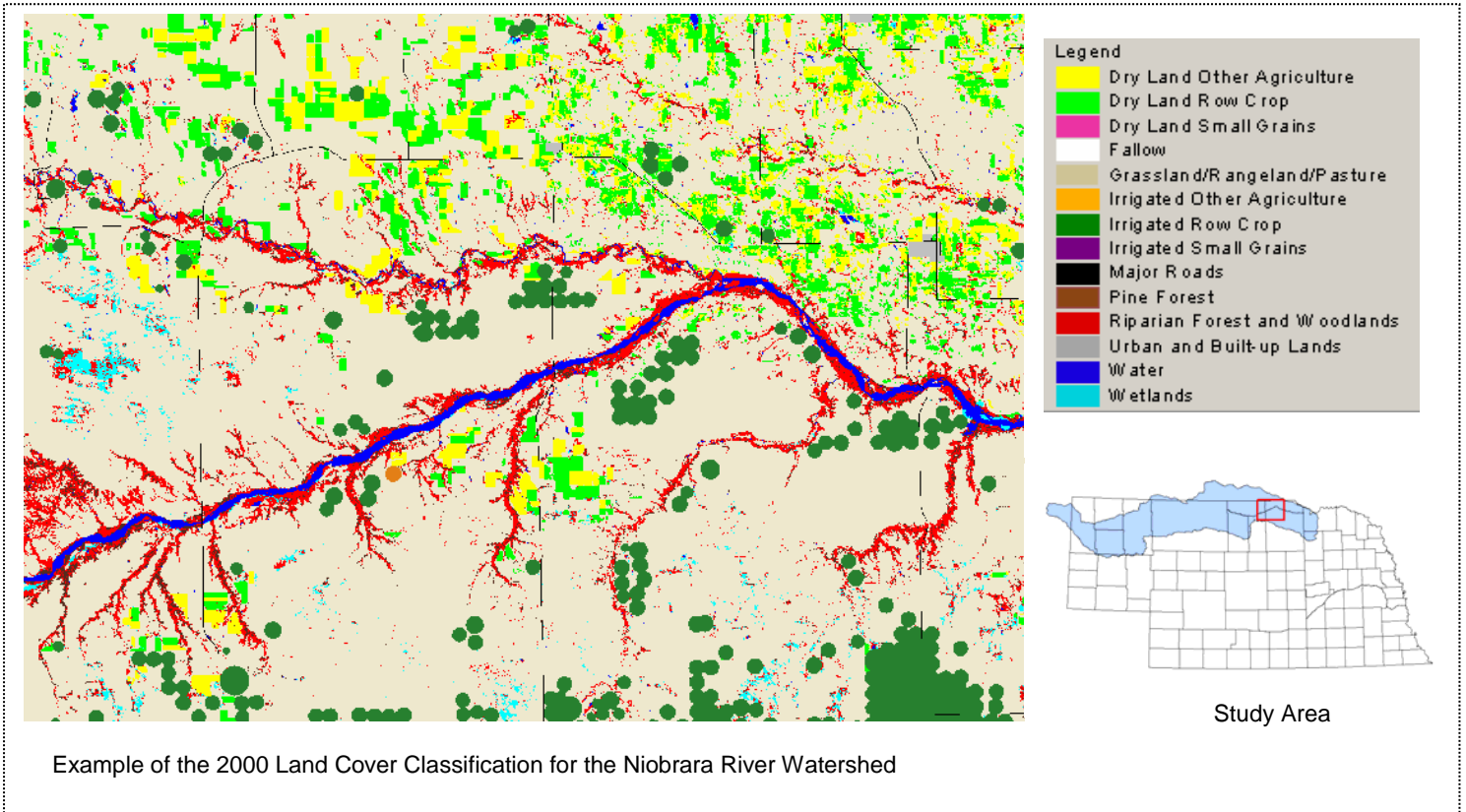
## FACT SHEET

"CURRENT APPLICATIONS"  
PUBLIC OUTREACH SERIES

Funding for this project has been provided through the **U.S. Bureau of Reclamation and the Nebraska Game and Parks Commission**. This Fact Sheet series provides educational information on current examples of common remote sensing applications from AV Members; however, no endorsement of or association with **AmericaView<sup>SM</sup>** by any funding agency other than the USGS

# Land Cover Inventory of the Niobrara River Watershed

**Principal Investigators** Patti R. Dappen, CALMIT, University of Nebraska-Lincoln (pdappen@calmit.unl.edu)  
James W. Merchant, CALMIT, University of Nebraska-Lincoln (jmerchant1@unl.edu)



**Introduction:** The Niobrara River watershed covers a large area in northern Nebraska, and neighboring parts of South Dakota and Wyoming, and is an important component of statewide natural resources management. Under ongoing agreements with the U.S. Bureau of Reclamation (BoR), the Nebraska Game and Parks Commission are charged with the development of management plans for various BoR projects in the Niobrara River watershed in Nebraska. A detailed delineation of land use and land cover patterns was needed in order to define and implement effective management strategies.

**Methods:** This project involved integrating remote sensing, spatial, and field data analysis to provide a map of land cover in the Niobrara River Watershed for the year 2000. Multi-date Landsat-7 Enhanced Thematic Mapper (ETM+) satellite imagery was used to generate this map. Imagery was selected to represent summer and fall growing conditions, with cloud coverage dictating specific date selection.

**Image Classification:** An unsupervised classification was performed on the multi-date imagery. After running the classification algorithm the output clusters were initially labeled based on their spatial, spectral and temporal characteristics. Each cluster was assigned to one of the target land cover classes using current ancillary data. Field data for crops were obtained from USDA Farm Service Agency (FSA) records. Irrigated cropland areas (center pivots) were identified using the 2000 Landsat 7 ETM+ data. The National Wetland Inventory was incorporated for wetland identification. Urban areas were defined using 2000 U.S. Bureau of the Census Topologically Integrated Geographic Encoding and Referencing system (TIGER) data and other information was gathered from 1993 USGS Digital Orthophoto Quarter Quadrangles. In all, 14 different land cover classes were identified.

**Project Results:** The Niobrara River Watershed land cover classification and final report are available on line at: <http://www.calmit.unl.edu/niobrara>